

## Optoelectronic Devices Derating

Table 1 provides the recommended derating values for the LED optoelectronic components discussed in this section. For definitions of Quality System (QS) and environments (protected, normal, and severe), see Foundation - Environmental Categories and the derating tables for discrete semiconductors.

Table 1. Derating of LED components

	Parameter	QS	Protected	Normal	Severe
LEDs	Forward Current ( $I_F$ )	1	80%	75%	65%
	Max $T_J$ ( $^{\circ}C$ )		110 $^{\circ}C$	110 $^{\circ}C$	105 $^{\circ}C$
	$I_F$ $T_J$	2	75% 110 $^{\circ}C$	60% 105 $^{\circ}C$	50% 95 $^{\circ}C$
	$I_F$ $T_J$	3	50% 95 $^{\circ}C$	50% 75 $^{\circ}C$	

Note: For red, yellow, and green type LEDs, derate power linearly from +25 $^{\circ}C$  at 1.4mW/ $^{\circ}C$ . For red, yellow and green LEDs with internal current regulation requiring no external resistors for operation on any voltage from 3V dc to 30V dc, derate power at 3.0mW/ $^{\circ}C$  above +25 $^{\circ}C$ .

### Laser Diodes

Laser diode derating considerations are the same as those of other diodes covered in the sections on Discrete Semiconductors.

### Optical Fiber, Cable and Connectors

Optical fiber, cable and connector derating is not applicable.

### Phototransistors, Photodiodes, and Optocouplers

Recommended phototransistors, photodiodes, and optocoupler derating values are summarized in Table 2. More specific guidance on recommendations and manufacturer's specifications are provided in MIL-PRF-19500/548 and /486 (optocouplers).

Table 2. Recommended Derating Values for Detectors and Optocouplers

	Parameter	Derate To
Photodiodes	Power	80% 75%

Phototransistors	Current	75%
	Voltage	80%
	Power	75%
Optocouplers	Current	80%
	Voltage	75%
	Power	75%
	Voltage	75%

Notes:

1. For optocouplers, use manufacturer's recommended operating conditions to achieve optimum coupling efficiency.
2. Junction temperature should be limited to +95°C or to 25°C below the manufacturer's maximum rating, whichever is lower.
3. Derate power for optocouplers at 2.5mW/°C above +25°C.

**Infrared Light-Emitting Diodes**

Infrared light-emitting diodes should be current de-rated at 50% to +65°C and above +65°C, de-rated linearly to +125°C at 0.67milliamps/°C.